



LITEMAX DLF/DLH0835 V2 Sunlight Readable 8.4" LED B/L LCD

User Manual

(1st Edition 2012/3/23)

All information is subject to change without notice.

Approved by	Checked by	Prepared by

FOR MORE INFORMATION:

AZ DISPLAYS, INC.

75 COLUMBIA, ALISO VIEJO, CA 92656

PHONE: (949) 360 5830

E-MAIL: sales@azdisplays.com

Website: www.azdisplays.com

RECORD OF REVISION

Version and Date	Page	Old Description	New Description	Remark
Mar,23,2012	all		Initial Release	

Contents

RECORD OF REVISION	2
Contents.....	3
1.0 GENERAL DESCRIPTION	4
2.0 Input Terminals.....	6
3.0 Electrical Characteristics	9
4.0 TIMING Characteristics of Input Signals.....	11
5.0 Input Signals, Basic Display Colors and Gray Scale of Each Color	12
6.0 OPTICAL SPECIFICATION.....	13
7.0 LED DRIVING BOARD SPECIFICATIONS	16
8.0 AD5621GD SPECIFICATION (DLH0835 V2 Only)	19
General Description	19
Supported Timing (*by your panel resolution)	20
Outline Dimensions	22
Pin Define	23
CN1: Panel connector	24
CN2: DVI-D Input connector	24
CN3: DVI-D Input connector(16pin connector)	25
CN4: Analog RGB Input connector(D-SUB 15Pin)	25
CN5: Analog RGB Input connector(13pin connector)	25
J1: Power DIN Jack(12V).....	26
J2: Power connector(12V)	26
J3: Power connector(5V)	26
J4: Inverter Connector	26
J5,J6: FAN	26
J7: Key Pad	26
J8: TO Audio PCB connector(Audio control)	27
J9: Ambient.....	27
J10: VR connector	27
J11: G-PROBE(RS232).....	27
JP1:PANEL VCC.....	27
DC characteristics.....	27
OSD menu.....	28
9.0 MECHANICAL DRAWING.....	34
10.0 PRECAUTIONS	35

1.0 GENERAL DESCRIPTION

DLF/DLH0835 V2 is a replaced model of DLF/DLH0835 V1. It is a color TFT-LCD Display as active switching devices with 1,000nits LED backlight powered by Durapixel™ technology. This LCD display has a 8.4 inch diagonally measured active area with SVGA resolutions (800 horizontal by 600 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16.2M colors.

1.1 FEATURES

- Sunlight Readable
- LED Backlight
- High Shock & Vibration Resistance
- Low Power Consumption
- High Uniformity
- Low EMI Noise
- Wide Dimming
- Life Expectancy
- Operation Temperature

1.2 GENERAL SPECIFICATIONS

Model No.	DLF0835 V2	DLH0835 V2
Description	8.4" TFT LCD, LED Backlight 1000 nits, SVGA	
Display Area (mm)	170.4(H) x 127.8(V)	
Brightness	1000 cd/m ²	
Resolution	SVGA (800 x 600)	
Contrast Ratio	450 : 1	
Pixel Pitch (mm)	0.213 x 0.213	
Viewing Angle	130°(H), 120°(V)	
Display Colors	16.2M / 262K	
Response Time (Typical)	35 ms	
Sync	LVDS	
Power Consumption	W	
Dimensions (mm)	199.5(W) x 154(H) x 12.45(D)	
Weight (Net)	0.33Kg	

1.3 Difference of V1 & V2

Model	Bezel Opening	Outline Dimension	View Angle	Response Time	Color	Contrast Ratio	LID Dimension
DLF0835 V1	175.5x133	199.5x149.5x11.6	120°(H)~120°(V)	30ms	16.2M	600:1	124x50x15
DLF0835 V2	173.4x130.8	199.5x154x11.6	130°(H)~120°(V)	35ms	262K/16.2M	450:1	70x30x7

1.4 ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Condition	Ratings	Unit	Remark
Supply voltage	V _{CC}	T _a =25°C	0 ~ +4.0	V	
	V _{LED}	T _a =25°C	-0.3 ~ +30.0	V	
Input voltage	V _{IN}	T _a =25°C	-0.3 ~ +V _{CC} +0.3	V	【*5-1】
	V _{PWM}	T _a =25°C	-0.3 ~ +30.0	V	【*5-2】
Storage temperature	T _{stg}	—	-30 ~ +75	°C	【*5-3,5-4,5-6】
Operating temperature	T _{ope}	—	-30 ~ +75 (Panel surface [display area])	°C	

【*5-1】 RxINi-/(i=0,1,2), CK IN-/, REV, 8/6Bit

【*5-2】 PWM

【*5-3】 Humidity: 95%RH Max.(T_a≤40°C) Note static electricity.

Maximum wet-bulb temperature at 39°C or less. (T_a>40°C) No condensation.

【*5-4】 The operating temperature only guarantees operation of the circuit. For contrast, speed response, and other factors related to display quality, judgment is done using the ambient temperature T_a = +25°C.

【*5-5】 Use over the absolute maximum rating might affect reliability and might cause malfunction.

【*5-6】 There is a possibility of causing deterioration in the irregularity and others of the screen and the display fineness though the liquid crystal module doesn't arrive at destruction when using it at 65~75°C.

2.0 Input Terminals

TFT-LCD panel driving

CN1 (Interface signals and +3.3V power supply)

Corresponding connectors: DF19G-20S-1C (Hirose Electric Co., Ltd.)

DF19G-20S-1SD (Hirose Electric Co., Ltd.)

20230-020B-F (I-PEX)

(※) Please do not use it besides corresponding connector

CN1

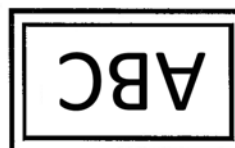
Pin	Symbol	Function	Remark
1	VCC	+3.3V Power supply	
2	VCC	+3.3V Power supply	
3	GND	GND	
4	GND	GND	
5	RxIN0-	LVDS receiver signal CH0 (-)	【*4-1】
6	RxIN0+	LVDS receiver signal CH0 (+)	【*4-1】
7	GND	GND	
8	RxIN1-	LVDS receiver signal CH1 (-)	【*4-1】
9	RxIN1+	LVDS receiver signal CH1 (+)	【*4-1】
10	GND	GND	
11	RxIN2-	LVDS receiver signal CH2 (-)	【*4-1】
12	RxIN2+	LVDS receiver signal CH2 (+)	【*4-1】
13	GND	GND	
14	CK IN-	LVDS receiver signal CK (-)	【*4-1】
15	CK IN+	LVDS receiver signal CK (+)	【*4-1】
16	GND	GND	
17	RxIN3-	LVDS receiver signal CH3 (-)	【*4-1,4-5】
18	RxIN3+	LVDS receiver signal CH3 (+)	【*4-1,4-5】
19	REV	Horizontal/Vertical display mode select signal	【*4-3】
20	8/6Bit	8Bit/6Bit select terminal	【*4-4】

【*4-1】 Please refer to 4-2 and 7-2 for correspondence of RxINi (i=0,1,2,3) and actual display-data.

【*4-2】 The shielding case is connected with GND-line in the module.

【*4-3】 REV = LOW or OPEN

REV = HIGH



【*4-4】 terminal function table

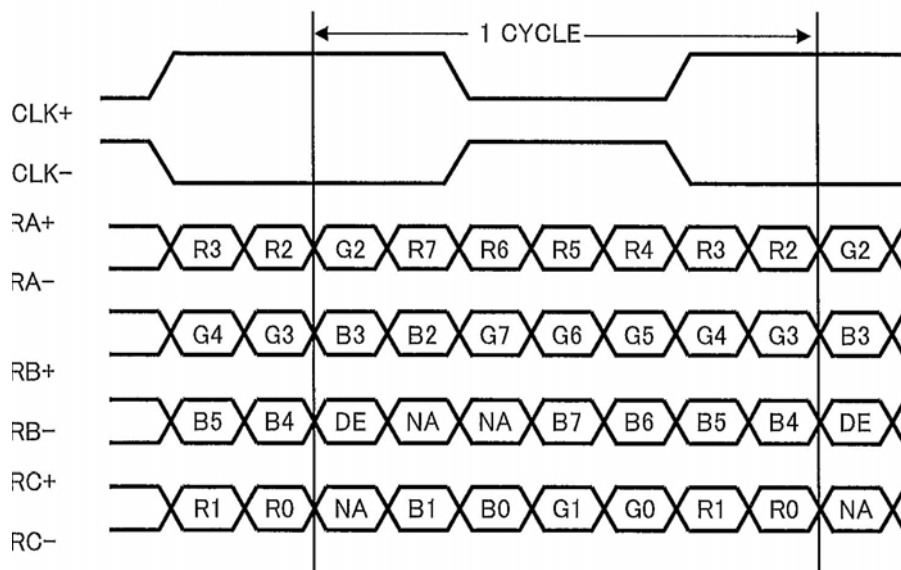
"H"	8Bit input mode
"L" or Open	6Bit input mode

【*4-5】 When use 6Bit input mode, please connects RxIN3+/- and GND-line.

Data Mapping

pin assignment ex) (THC63LVDM83R/D (Thine electronics) or Compatible product)

Transmitter		CN1 20Pin (8/6Bit)	
Pin No	Data	= "H" (8bit)	= "L" or Open (6bit)
51	TA0	R2	R2(LSB)
52	TA1	R3	R3
54	TA2	R4	R4
55	TA3	R5	R5
56	TA4	R6	R6
3	TA5	R7(MSB)	R7(MSB)
4	TA6	G2	G2(LSB)
6	TB0	G3	G3
7	TB1	G4	G4
11	TB2	G5	G5
12	TB3	G6	G6
14	TB4	G7 (MSB)	G7 (MSB)
15	TB5	B2	B2(LSB)
19	TB6	B3	B3
20	TC0	B4	B4
22	TC1	B5	B5
23	TC2	B6	B6
24	TC3	B7 (MSB)	B7 (MSB)
27	TC4	(NA)	(NA)
28	TC5	(NA)	(NA)
30	TC6	DE	DE
50	TD0	R0(LSB)	R0(GND)
2	TD1	R1	R1(GND)
8	TD2	G0(LSB)	G0(GND)
10	TD3	G1	G1(GND)
16	TD4	B0(LSB)	B0(GND)
18	TD5	B1	B1(GND)
25	TD6	(NA)	GND



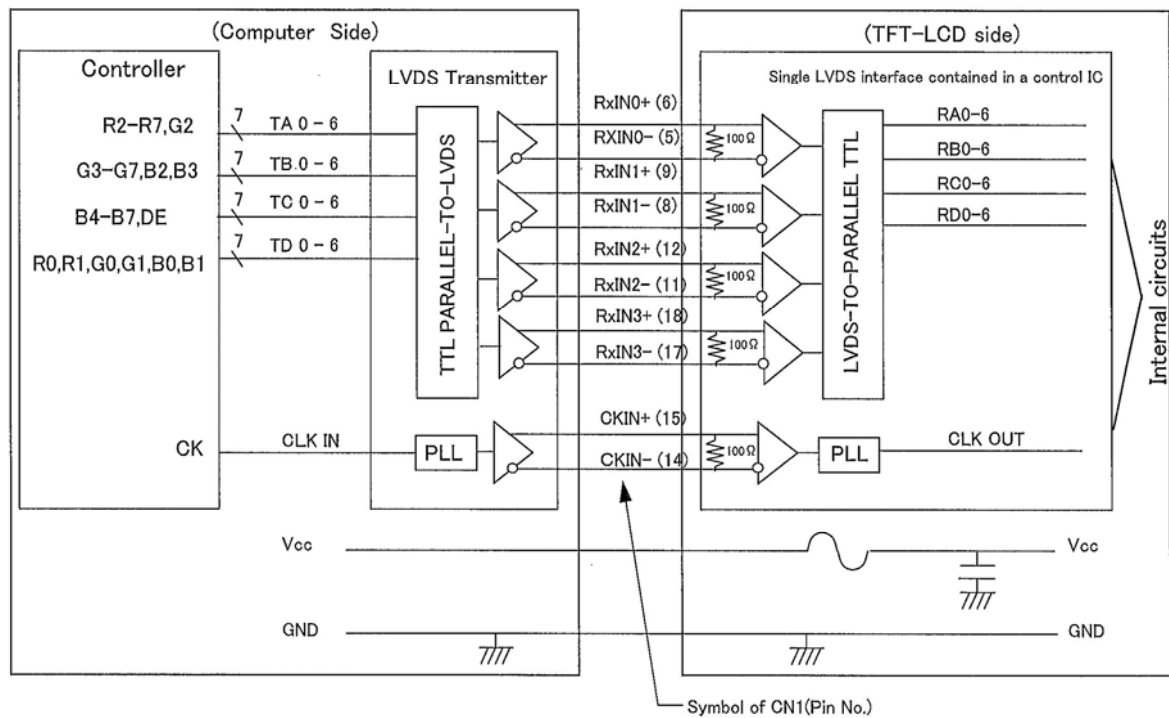
DE: Display Enable

NA: Not Available

Interface block diagram

Using LVDS receiver: Building into cotroll IC(THC63LVDF84B(Thine electronics) or Compatible product)

Corresponding LVDS transmitter:THC63LVDM83R/D(Thine electronics) or Compatible product



* When use 6Bit input mode, please connects RxIN3+/- and GND-line.

3.0 Electrical Characteristics

TFT-LCD panel driving

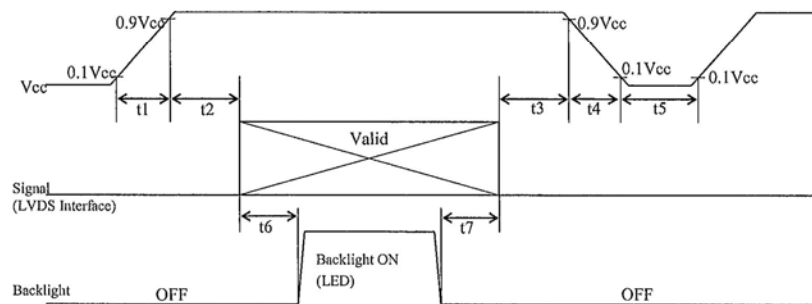
$T_a = +25^{\circ}\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Input voltage	V_{CC}	+3.0	+3.3	+3.6	V	【*6-3】
Current dissipation	I_{CC}	—	300	380	mA	【*6-4】
Permissible input ripple voltage	V_{RP}	—	—	100	mV _{p-p}	$V_{CC} = +3.3\text{V}$
Input voltage width for LVDS receiver	V_I	0	—	2.4	V	LVDS signal
Differential input	High	V_{TH}	—	+100	mV	$V_{CM} = +1.2\text{V}$ 【*6-1】
Threshold voltage	Low	V_{TL}	—	—	mV	
Input reak current (Hight)	I_{OH1}	—	—	± 10	μA	$V_I = +2.4\text{V}$
	I_{OH2}	—	—	± 500	μA	【*6-2】 $V_{CC} = +3.6\text{V}$
Input reak current (Low)	I_{OL1}	—	—	± 10	μA	$V_I = 0\text{V}$
	I_{OL2}	—	—	± 500	μA	【*6-2】 $V_{CC} = +3.6\text{V}$
Terminal resistor	R_T	—	100	—	Ω	Differential input

VCM : LVDS common mode voltage

REV, 8/6bit

On-off conditions for supply voltage

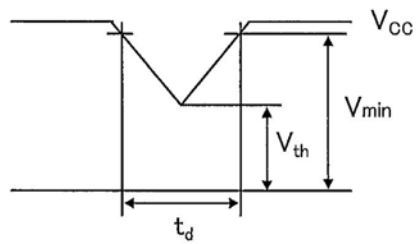


Symbol	Min.	Max.	Unit	Remark
t1	0	25	ms	
t2	0	100	ms	
t3	0	1	s	
t4	0	400	ms	
t5	200	—	ms	
t6	180	—	ms	*1
t7	5	—	ms	*1

*1: As for the power sequence for backlight, it is recommended to apply above mentioned input timing. If the backlight is lit on and off at a timing other than shown above, displaying image may get disturbed. This is due to variation of output signal from timing generator when LVDS signal is changed from on to off or vice versa, but has no harm to the module itself.

【Note】Please do not put the input signal into the state of the High impedance for power ON period, and do not input the abnormal signal.

V_{CC}-dip conditions



$$V_{th} = 2.5V$$

$$V_{min} = 3V$$

1) $+2.5V \leq V_{CC} < +3.0V$, $t_d \leq 10ms$

Under above condition, the display image should return to an appropriate figure after V_{CC} voltage recovers.

2) $V_{CC} < +2.5V$

V_{CC}-dip conditions should also follow the On-off conditions for supply voltage

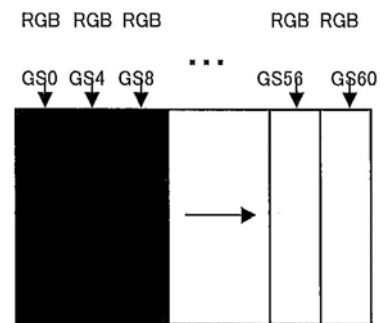
Current dissipation

Typical current situation : 16-gray-scale-bar pattern

(V_{CC}=+3.3V, gray-scale: GS(4n))

However, assume n to be a natural number from 0 to 15, and refer to Chapter 8 for gray scale of RGB.

Maximum current situation : V_{CC}=+3.0V

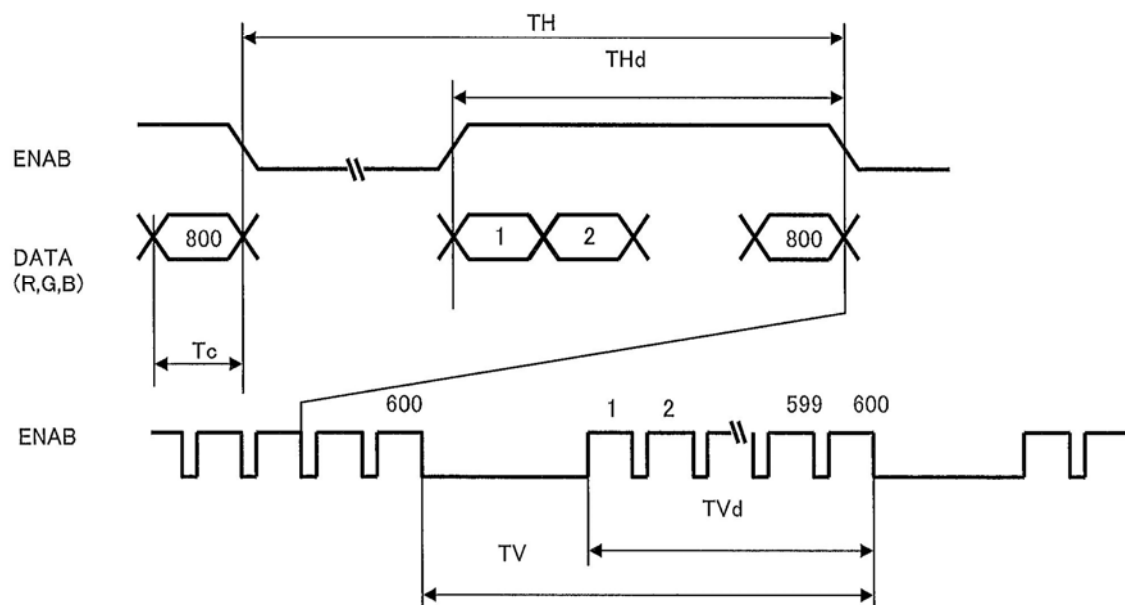


4.0 TIMING Characteristics of Input Signals

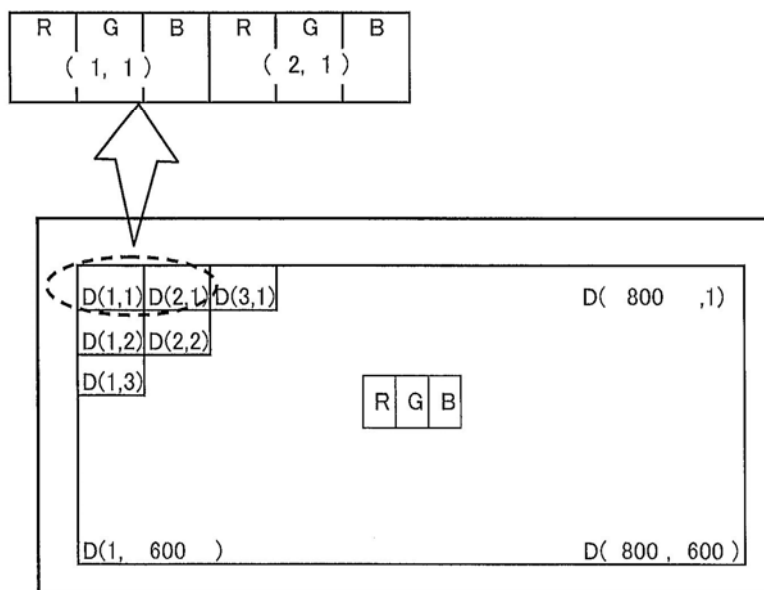
Timing characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Clock	Frequency	1/Tc	35.0	40	42.0	MHz
ENAB	Horizontal period	TH	832	1056	1395	clock
			20.8	26.4	39.9	μ s
	Horizontal period (High)	THd	800	800	800	clock
	Vertical Frequency	TV	628	666	798	line
			—	17.6	—	ms
	Vertical period (High)	TVd	600	600	600	line

【*7-1】 In case of using the long vertical period, the deterioration of display quality, flicker etc. may occur.



Input Data Signals and Display Position on the screen



5.0 Input Signals, Basic Display Colors and Gray Scale of Each Color

Input Signals, Basic Display Colors and Gray Scale of Each Color

	Colors & Gray scale	Data signal																											
		Gray Scale	R0	R1	R2	R3	R4	R5	R6	R7	G0	G1	G2	G3	G4	G5	G6	G7	B0	B1	B2	B3	B4	B5	B6	B7			
Basic Color	Black	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Blue	—	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	1		
	Green	—	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0		
	Cyan	—	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1	1		
	Red	—	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Magenta	—	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	1		
	Yellow	—	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0		
	White	—	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1	X	X	1	1	1	1	1	1	1		
Gray Scale of Red	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	↑	GS1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Darker	GS2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	↑	↑	↑								↑								↑										
	↓	↓	↓								↓								↓										
	Brighter	GS250	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	↓	GS251	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Red	GS252	X	X	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Gray Scale of Green	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	↑	GS1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	Darker	GS2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
	↑	↑	↑								↑								↑										
	↓	↓	↓								↓								↓										
	Brighter	GS250	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0		
	↓	GS251	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0		
	Green	GS252	0	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	0	0	0	0	0	0	0	0	0		
Gray Scale of Blue	Black	GS0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
	↑	GS1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0		
	Darker	GS2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0		
	↑	↑	↑								↑								↑										
	↓	↓	↓								↓								↓										
	Brighter	GS250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	1	1		
	↓	GS251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	1	1	1	1	1		
	Blue	GS252	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X	1	1	1	1	1	1	1		

0 :Low level voltage 1 :High level voltage X :Don't care

Each basic color can be displayed in 253 gray scales from 8 bit data signals. According to the combination of, total 24 bit data signals, the 16-million-color display can be achieved on the screen.

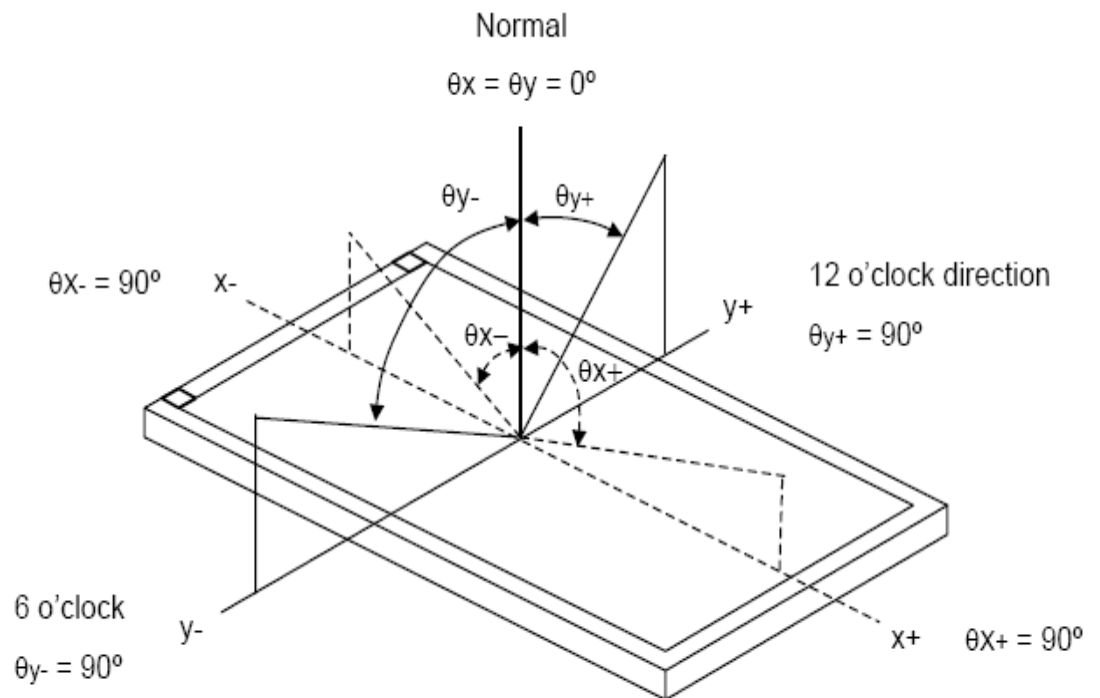
6.0 OPTICAL SPECIFICATION

Optical

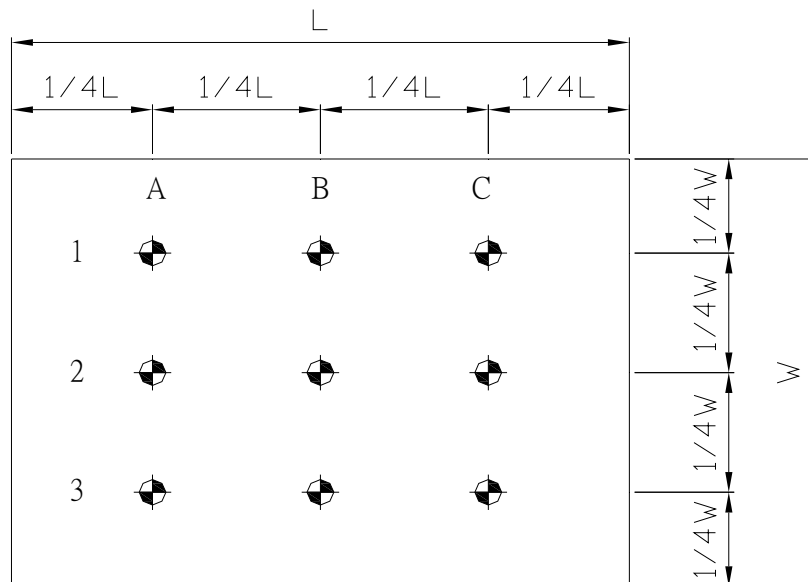
Item		Symbol	Condition	Data	Unit	Note	
Color chromaticity	Red	R _x	$\theta_x=0$ $\theta_y=0$ BM-7	0.5655	-	Test Mode : (1) (2) (3)	
		R _y		0.3286	-		
	Green	G _x		0.3496	-		
		G _y		0.6036	-		
	Blue	B _x		0.1492	-		
		B _y		0.1196	-		
	White	W _x		0.3041	-		
		W _y		0.3453	-		
	Center Luminance of White			L _c	1000		cd/m ²
	Average			L _a	997		cd/m ²
Uniform		L _u	80	%			
Contrast Ratio		CR	$\theta_x=0$	450 : 1	-	Test Mode : (1) (4)	
Color Saturation		NTSC	$\theta_y=0$ Klein K-10	54.33	%		
Viewing Angle	Horizontal	θ_{x+}	CR≥10	65	Deg	Test Mode : (1) (3)	
		θ_{x-}		65			
	Vertical	θ_{y+}		60			
		θ_{y-}		55			

Test Mode :

(1) Definition of Viewing Angle (θ_x , θ_y) :

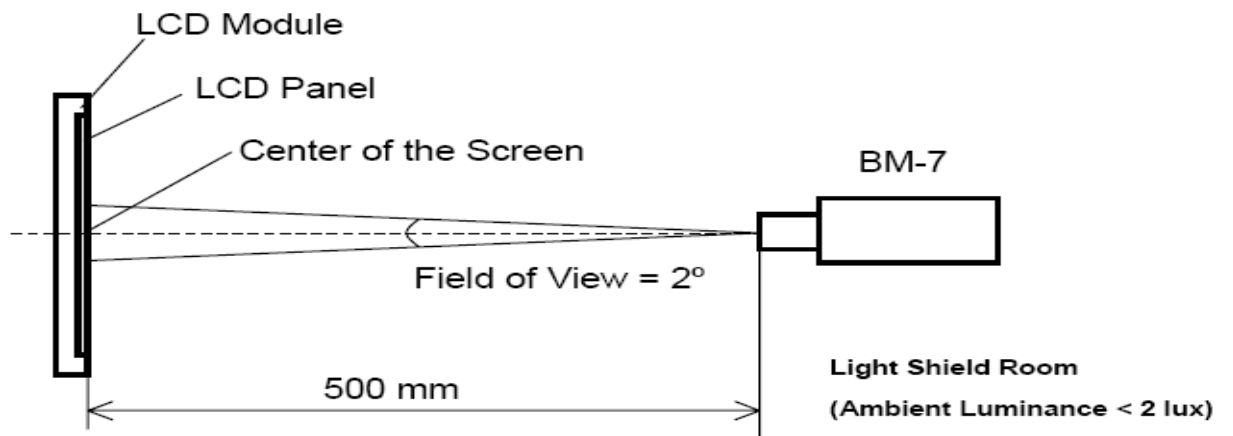


(2) Definition of Test Point :

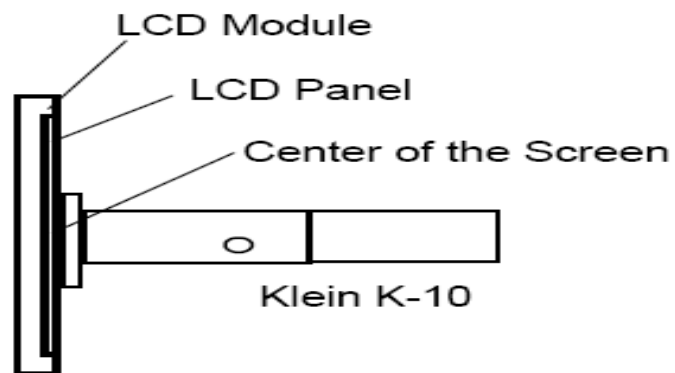


Active Area

(3) BM-7 Measurement Setup:



(4) Klein K-10 Measurement Setup:



7.0 LED DRIVING BOARD SPECIFICATIONS

1. LED Application

This specification is applied to LED converter unit for DLF/DLH0835 V2(1000nit) LED backlight

2. Operating Characteristics

Item	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Remark
Input Voltage	Vin		10.0	12.0	14.0	V	
Input Current (Low Brightness)	IinL	VIN=12V,Vadj=5V	3	-----	-----	mA	
Input Current (High Brightness)	IinH	VIN=12V,Vadj=0V	0.456	0.377	0.319	A	
LED Current (Low Brightness)	IoutL	VIN=12V,Vadj=5V	0.0	-----	-----	Arms	
LED Current (High Brightness)	IoutH	VIN=12V,Vadj=0V	0.172	0.172	0.172	A	
Working Frequency	Freq	VIN=12V,Vadj=0V	523	550	580	KHz	
PWM Frequency	Freq	VIN=12V	180	200	220	HZ	
Brightness Control	Vadj	Connection of Voltage	0.5	-----	4.8	V	Vadj±5%
ON/OFF Control	Von/off	Normal Operation	2	-----	5	V	
Output Voltage	Vout	VIN=12V,Vadj=0V	24.172	24.136	24.121	V	
Efficiency	η	VIN=12V,Vadj=0V	91.75	91.76	92.90	%	

3. Connector Socket

3-1. Input Connector: J3(JST S 8B-PH-SM3-TB or Compatible)

PIN No	Symbol	Description
1	Vin	DC+12V
2	Vin	DC+12V
3	Vin	DC+12V
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	Brightness	Brightness Control 5V~0V
8	Control	ON/OFF Control 0.8V(OFF) 2~5V(ON)

3-2 .Output Connector: J1,J2(JST S 2B-ZR-SM3A-TF or Compatible)

PIN NO	Symbol	Description
1	Output	LED High Voltage(+)
2	Output	LED Low Voltage (-)

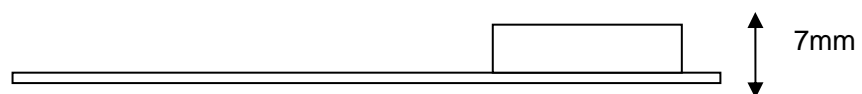
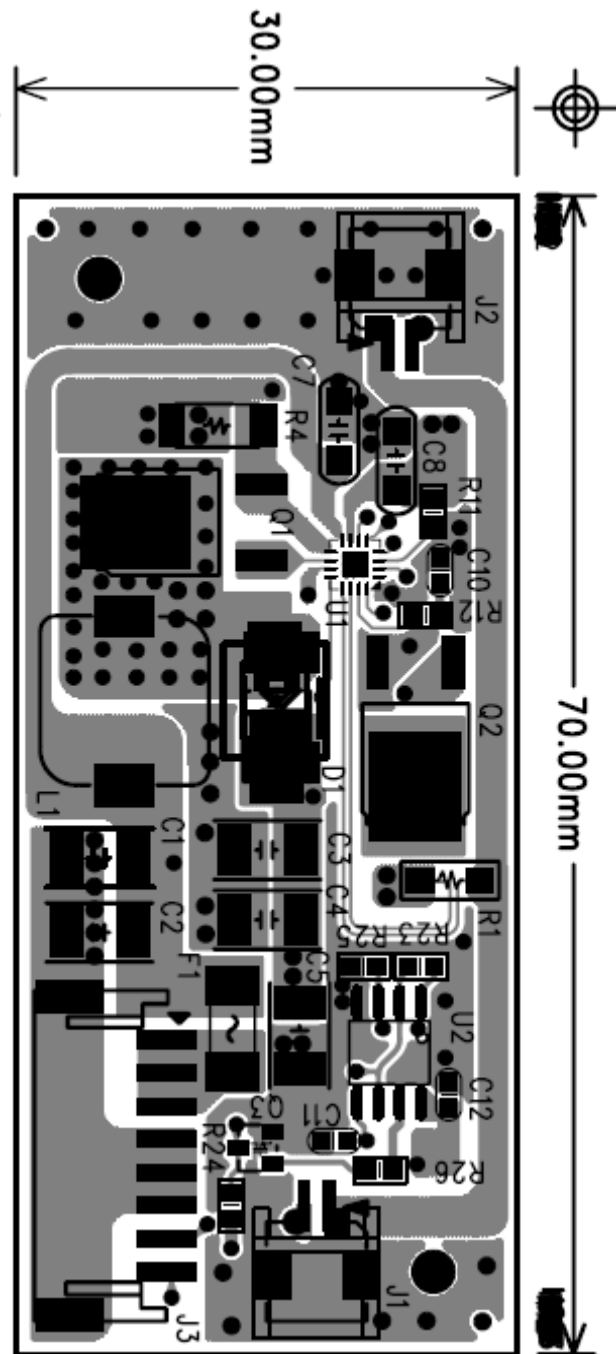
4. Mechanical Characteristics

Dimension: 70mm*30mm*7mm

INPUT CONNECTOR

J3:

PIN1:VIN
PIN2:VIN
PIN3:VIN
PIN4:GND
PIN5:GND
PIN6:GND
PIN7:BRIGHTNESS
PIN8:ON/OFF



8.0 AD5621GD SPECIFICATION (DLH0835 V2 Only)

We developed this A/D board to support industrial high brightness and commercial applications. This A/D board has many functions. It has options of external luminance sensor, a surface mounted VR button to control the brightness, fan rotation and thermal sensor. The rev.1 has released for European RoHS Compliant purpose.

General Description

- Max Resolution Up To WXGA 60Hz
- LVDS Output
- Support Panel DC5V or 3.3V, 12V Output
- External Fan Control by Software
- OSD Control
- Inverter 0~5V Dimming Control
- 2Wx2 Audio Output
- Input Power 12V
- Analog signal Input (RGB)
- *External V.R. brightness control
- *External light sensor brightness control

Supported Timing (*by your panel resolution)

The following table displays optimum quality modes that the LCD monitor provides. If the other video modes are used, the monitor will stop working or display a poor quality picture.

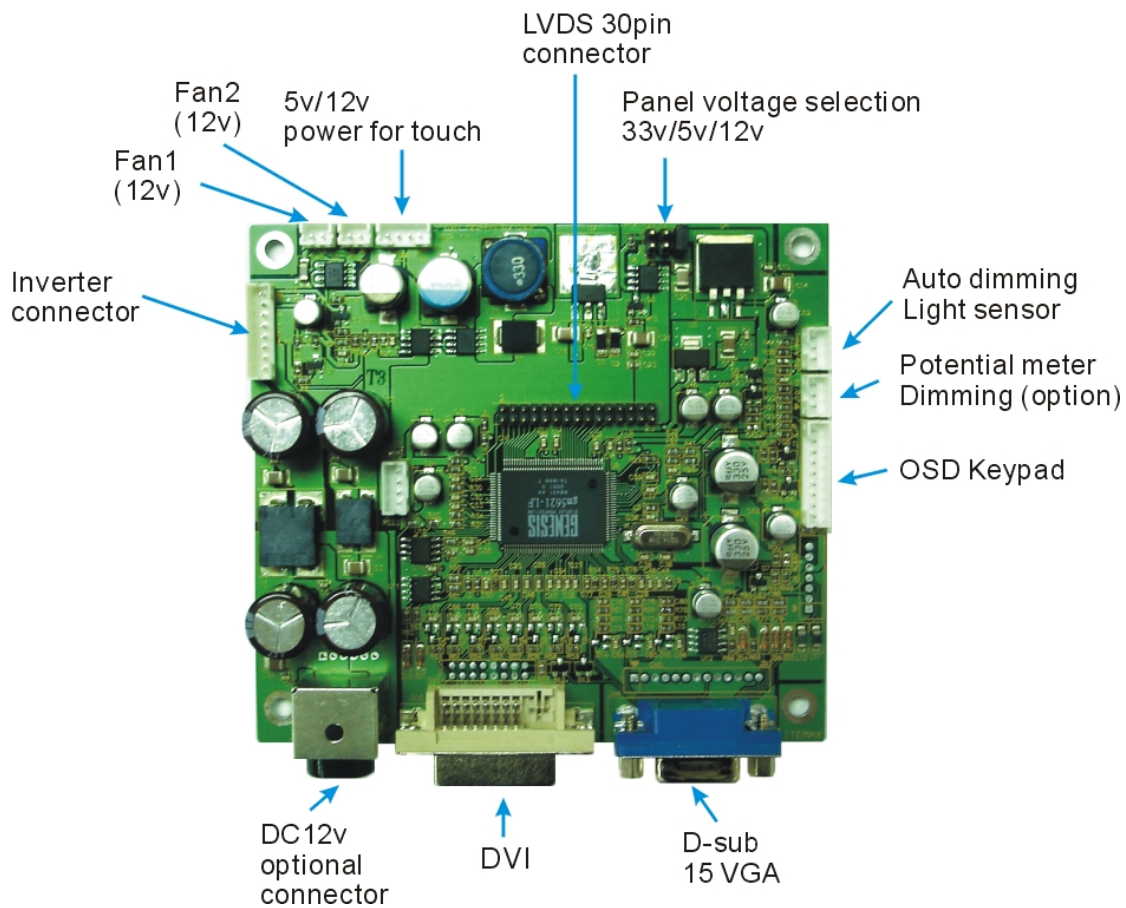
TIMMING	
MODE	RESOLUTION
VGA	640x480@60Hz
	640x480@72Hz
	640x480@75Hz
SVGA	800x600@56Hz
	800x600@60Hz
	800x600@72Hz
	800x600@75Hz
XGA	1024x768@60Hz
	1024x768@70Hz
	1024x768@75Hz
SXGA	1280x1024@60Hz
	1280x1024@70Hz
	1280x1024@75Hz
WXGA	1366x768@60Hz

Release Model: AD5621GD

AD5621-GD

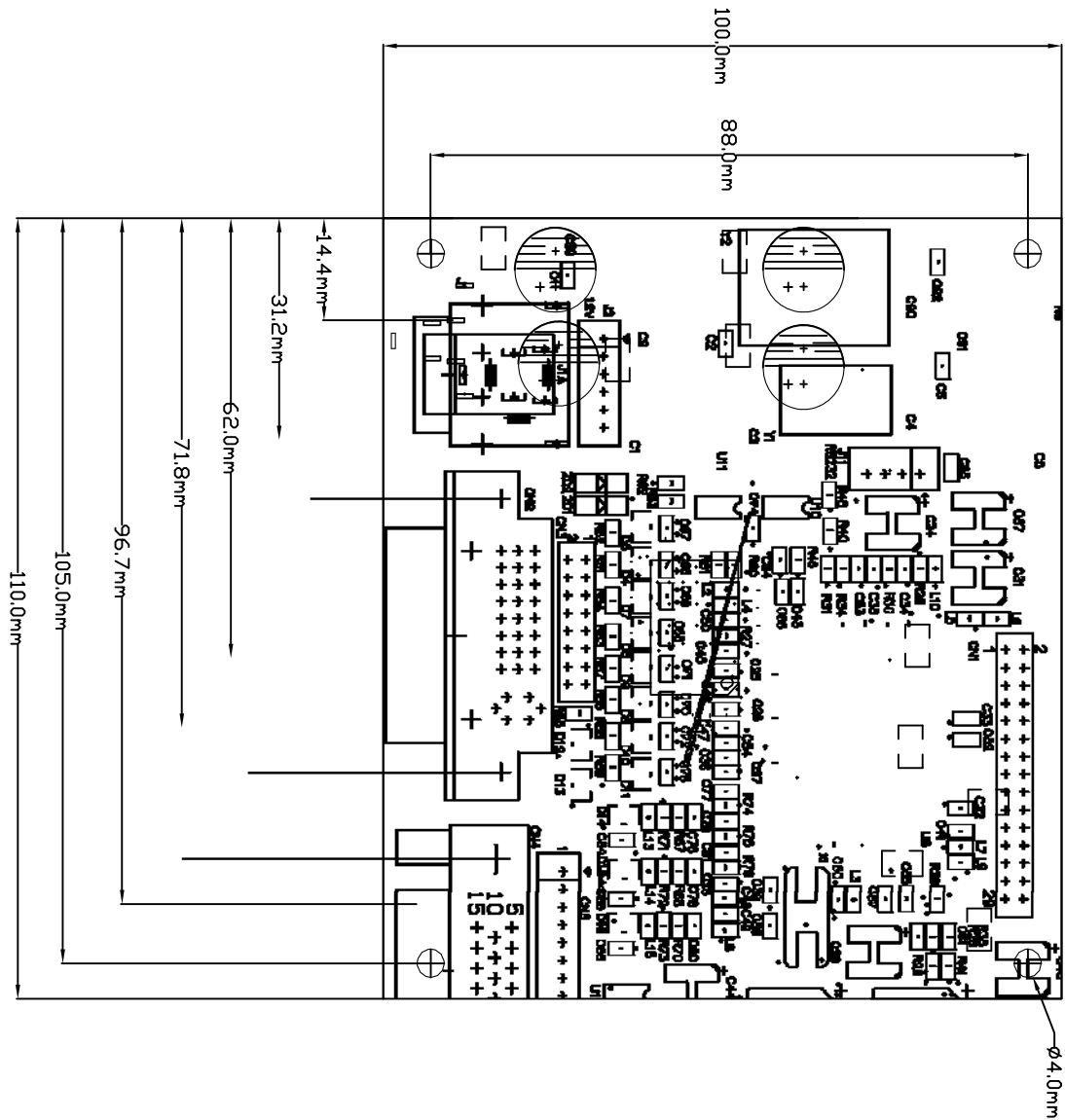
DVI

Basic VGA Input (analog in)

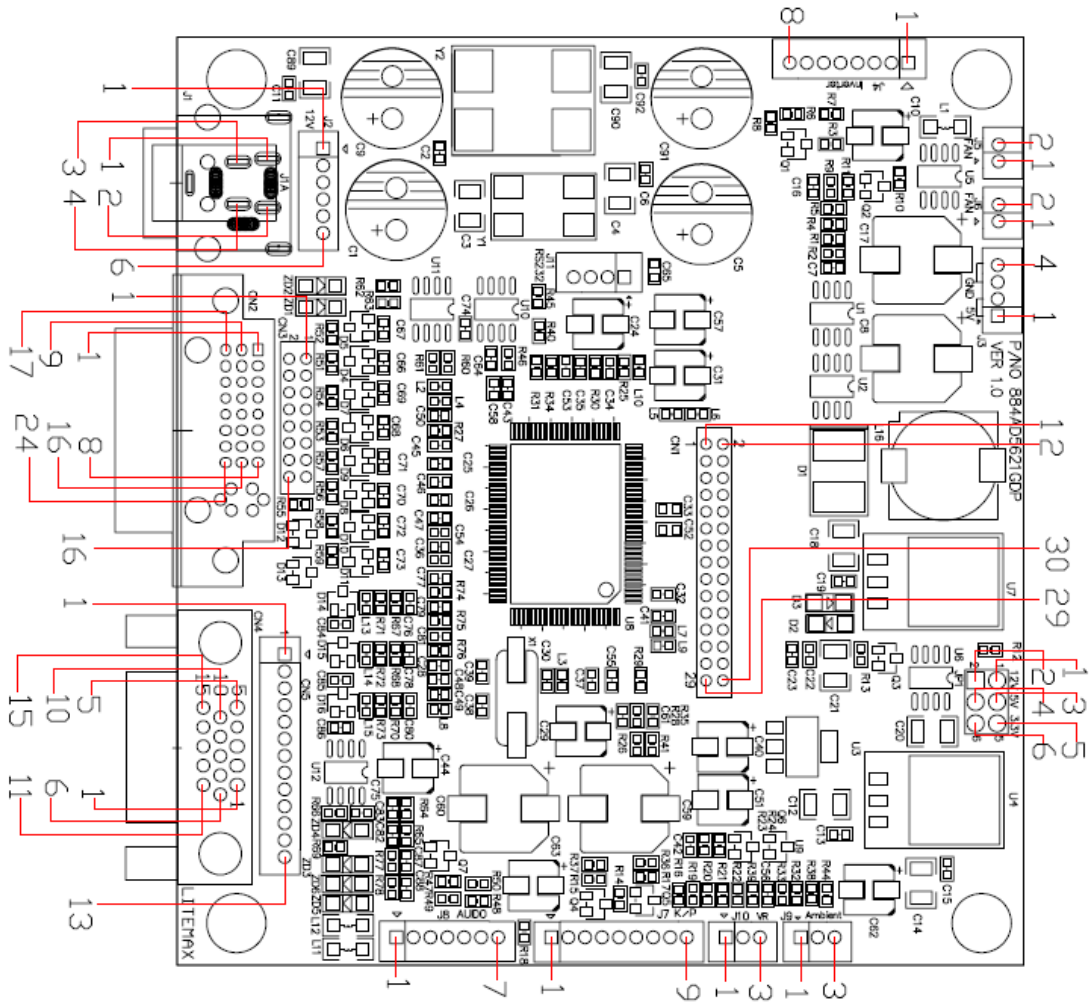


Outline Dimensions

unit:mm



Pin Define



CN1: Panel connector

Pin No.	Function	Pin No.	Function
1	RxO0+	16	RxE1-
2	RxO0-	17	RxE2+
3	RxO1+	18	RxE2-
4	RxO1-	19	RxEC+
5	RxO2+	20	RxEC-
6	RxO2-	21	RxE3+
7	RxOC+	22	RxE3-
8	RxOC-	23	GND
9	RxO3+	24	GND
10	RxO3-	25	GND
11	GND	26	GND
12	GND	27	PANEL-VCC
13	RxE0+	28	PANEL-VCC
14	RxE0-	29	PANEL-VCC
15	RxE1+	30	PANEL-VCC

CN2: DVI-D Input connector

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	T.M.D.S. Data2-	9	T.M.D.S. Data1-	17	T.M.D.S. Data0-
2	T.M.D.S. Data2+	10	T.M.D.S. Data1+	18	T.M.D.S. Data0+
3	T.M.D.S. Data2/4 Shield	11	T.M.D.S. Data1/3 Shield	19	T.M.D.S. Data0/5 Shield
4	T.M.D.S. Data4-	12	T.M.D.S. Data3-	20	T.M.D.S. Data5-
5	T.M.D.S. Data4+	13	T.M.D.S. Data3+	21	T.M.D.S. Data5+
6	DDC Clock	14	+5V Power	22	T.M.D.S. Clock Shield
7	DDC Data	15	Ground (for +5V)	23	T.M.D.S. Clock+
8	Not Connected	16	Hot Plug Detect	24	T.M.D.S. Clock-

CN3: DVI-D Input connector(16pin connector)

Pin No.	Function	Pin No.	Function	Pin No.	Function
1	T.M.D.S.	7	DDC Data	13	GND
2	T.M.D.S.	8	DDC Clock	14	GND
3	T.M.D.S.	9	GND	15	Hot Plug Detect
4	T.M.D.S.	10	GND	16	+5V Power
5	T.M.D.S.	11	T.M.D.S. Clock-		
6	T.M.D.S.	12	T.M.D.S. Clock+		

CN4: Analog RGB Input connector(D-SUB 15Pin)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	RED	Analog Red	9	NC	+5VDC
2	GREEN	Analog Green	10	SGND	Sync GND
3	BLUE	Analog Blue	11	NCD	Reserved
4	GND	Reserved	12	SDA	DDC Serial Data
5	NC	VGA_CAB	13	HSYNC	Horizontal Sync
6	RGND	Red Return	14	VSYNC	Vertical Sync
7	GGND	Green Return	15	SCL	DDC Data Clock
8	BGND	Blue Return			

CN5: Analog RGB Input connector(13pin connector)

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	SCL	DDC Data Clock	8	RED	Analog Red
2	SDA	DDC Serial Data	9	GGND	Green Return
3	GND	Reserved	10	GREEN	Analog Green
4	NC	VGA_CAB	11	BGND	Blue Return
5	VSYNC	Vertical Sync	12	BLUE	Analog Blue
6	HSYNC	Horizontal Sync	13	NC	+5VDC
7	RGND	Red Return			

J1: Power DIN Jack(12V)

Pin No.	Function	Pin No.	Function
1	12VDC	2	12VDC
3	GND	4	GND

J2: Power connector(12V)

Pin No.	Function	Pin No.	Function
1	12VDC	4	GND
2	12VDC	5	GND
3	12VDC	6	GND

J3: Power connector(5V)

Pin No.	Function	Pin No.	Function
1	5VDC	2	5VDC
3	GND	4	GND

J4: Inverter Connector

Pin No.	Symbol	Description	Pin No.	Symbol	Description
1	ON/OFF	Backlight ON/OFF	5	GND	GND
2	BRIGHT	Dimming adjust	6	12VDC	Input 12VDC
3	GND	GND	7	12VDC	Input 12VDC
4	GND	GND	8	12VDC	Input 12VDC

J5,J6: FAN

Pin No.	Function	Pin No.	Function
1	FAN(+)	2	GND

J7: Key Pad

Pin No.	Function	Pin No.	Function
1	POWER KEY	6	MENU KEY
2	GREEN LED	7	AUTO KEY
3	RED LED	8	GND
4	LEFT KEY	9	GND
5	RIGHT KEY		

J8: TO Audio PCB connector(Audio control)

Pin No.	Function	Pin No.	Function
1	12VDC	5	5VDC
2	12VDC	6	Volume
3	GND	7	Mute
4	GND		

J9: Ambient

Pin No.	Function	Pin No.	Function
1	NC	3	GND
2	L_Sensor		

J10: VR connector

Pin No.	Function	Pin No.	Function
1	3,3VDC	2	VR
3	GND		

J11: G-PROBE(RS232)

Pin No.	Function	Pin No.	Function
1	5VDC	3	RXD
2	TXR	4	GND

JP1: PANEL VCC

Pin No.	Function	Pin No.	Function
1-2	12V	5-6	3.3V
3-4	5V		

DC characteristics.

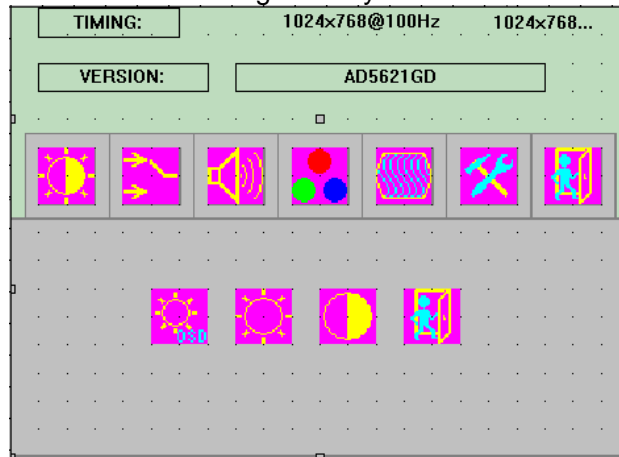
Power Consumption	6	W Note1
Operation Temperation	0~70	°C
Storage Temperature	-20~85	°C

Note: This Value is for a/d board body.

OSD menu

Here are some instructions for you to use the OSD (On Screen Display). By pressing the “menu”, you will see the below picture.

Timing shows resolution, H-frequency, and V-frequency of the panel. Version shows the firmware control version. This 2 information is not changeable by user.



There are 7 sub pages inside the OSD manual, Brightness, Signal select, Sound, Color, Image, Tools, and Exit.

When you press “menu” button, you enter the “Brightness” sub page. You will see 4 selections:



press “menu”



press “menu”



press “menu”



press “menu”



OSD Brightness:



press “right” key



press “menu” once, you can go into adjust the brightness. Press “left” you can dim down the brightness to “0”, while press “right” you can increase the brightness to “100”.



Ambient light sensor: press this Icon, must to accompany with Litemax ambient light sensor to auto dimming.(OPTION)



Potentiometer: press this icon, adjust VR function.(OPTION)



Ambient light sensor with OSD offset: press this Icon



Press “right” key



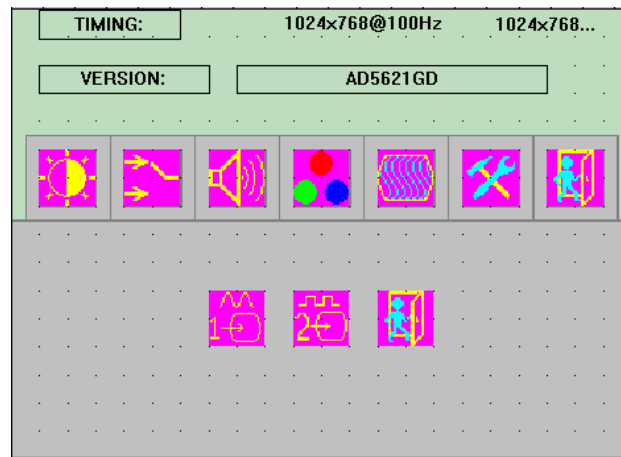
Press “menu” once, you can adjust min. luminance to fit your application (OPTION)



Contrast: Press “menu” and “right” you can adjust the contrast from “0” to “100” by pressing the “left” and “right”.



Exit: You can exit this sub menu back to normal screen.



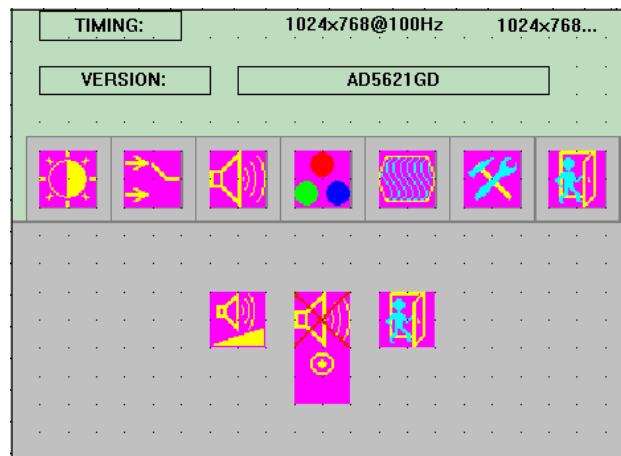
Analog: RGB/VGA INPUT



Digital: DVI input



Exit: You can exit this sub menu back to normal screen.



There are 3 options for “Sound” sub page.



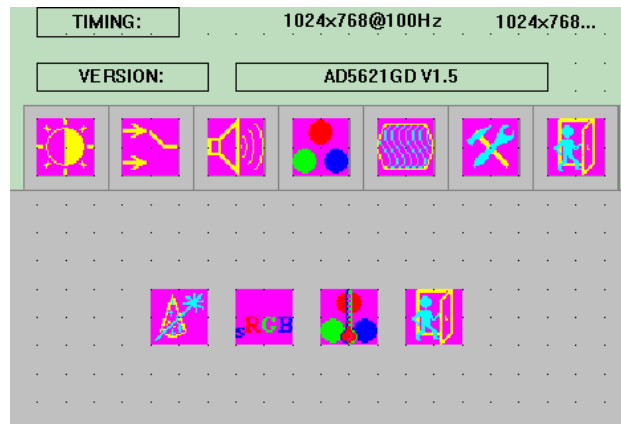
Audio Volume: Audio volume adjustment.



Mute: You can mute the speaker by pressing this option.



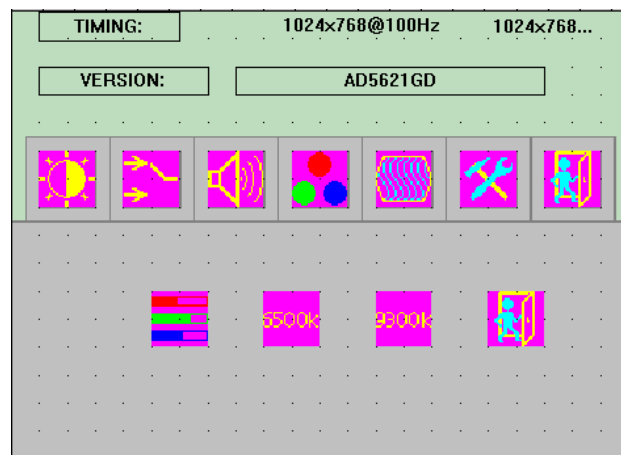
Exit: back to the normal screen.



Auto Color: by press this “Auto Color” option, you can get the optimal color performance.



sRGB: Windows standard color setting.



Color Tempture: You can have 3 options in this selection.



Color Tempture User



Color Tempture_6500K



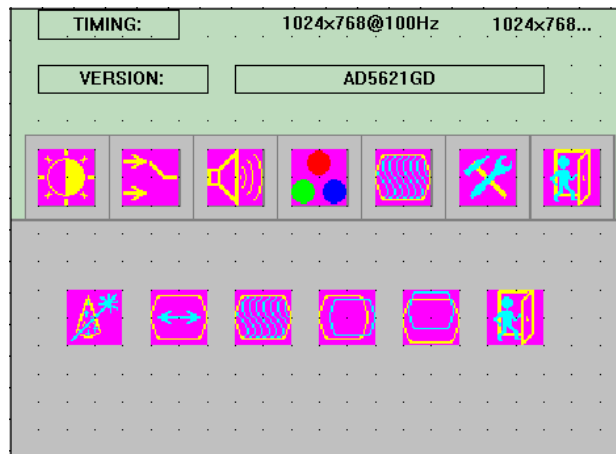
Color Tempture_9300K

“user mode”, “6500K” (Warm color scheme), “9300K (Cold color scheme).
Def ault is “user”, and inside all “R”, “G”, and “B” are set “100”



Exit: back to the normal screen.

Go into the “Image” page, you can see below picture.



Auto just: Pressing this option, the AD5621 will adjust the optimal frequency of horizontal and vertical. You will see “Auto tune....” On the screen for around 3 seconds.



Clock: If you are not satisfied about the Autotune result, you can adjust manually by “Clock”. The screen will be “wider” if you adjust this function.



Phase: If you see “double image” on characters, you can adjust “Phase” to make it perfect image.



HPos: You can shift the screen horizontally by this function.

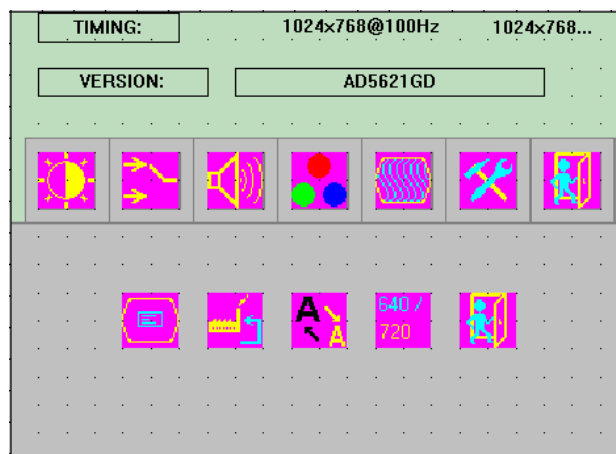


Vpos: You can shift the screen vertically by this function.

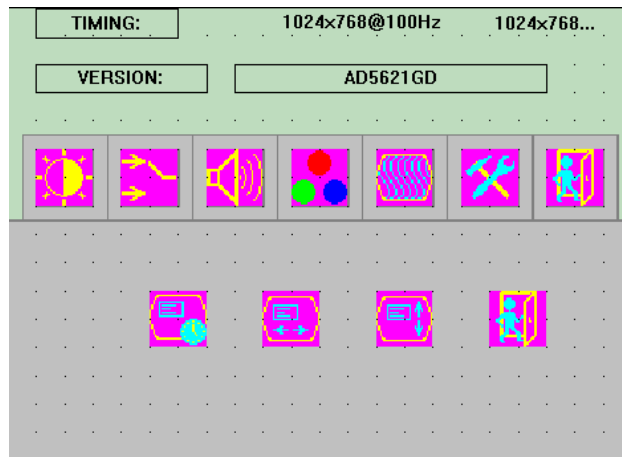


Exit: Back to normal screen.

On the “Tools” sub menu, you will see 5 icons.



Osd Control: Select this option, you will see 4 more options:



Osd_time: You can selection the time of OSD from 2 sec. to 16 sec.

D



Osd_HPos: You can move the OSD horizontally over the screen.



Osd_VPos: You can move the OSD Vertically over the screen.



Exit: back to main menu.



Factory_Reset: By pressing this, the screen will be back to the factory setting on very beginning and lost all the personal settings.



Sharpness: You can make the characters looks sharper.



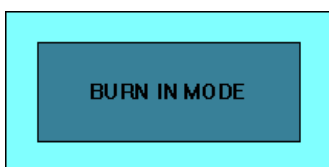
Dos_mode/Gxf_mode: Some old programs running over 640x400 and 720x400 (DOS Mode and graphics mode), you need to select this option manually.



Exit

Factory Burn-in mode: While your VGA cable is connected on the monitor, press “Menu” and Left “<” simultaneously, you will see “BURN IN MODE” on the center of the screen for 3 sec. Then unplug the VGA cable, the screen will show Red, Green, Blue, White, and Black in sequence automatically.

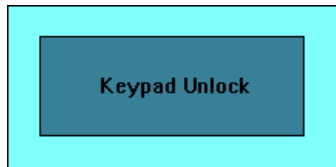
You can plug in the VGA signal cable, and re-plug the power connector to exit the burn-in mode.



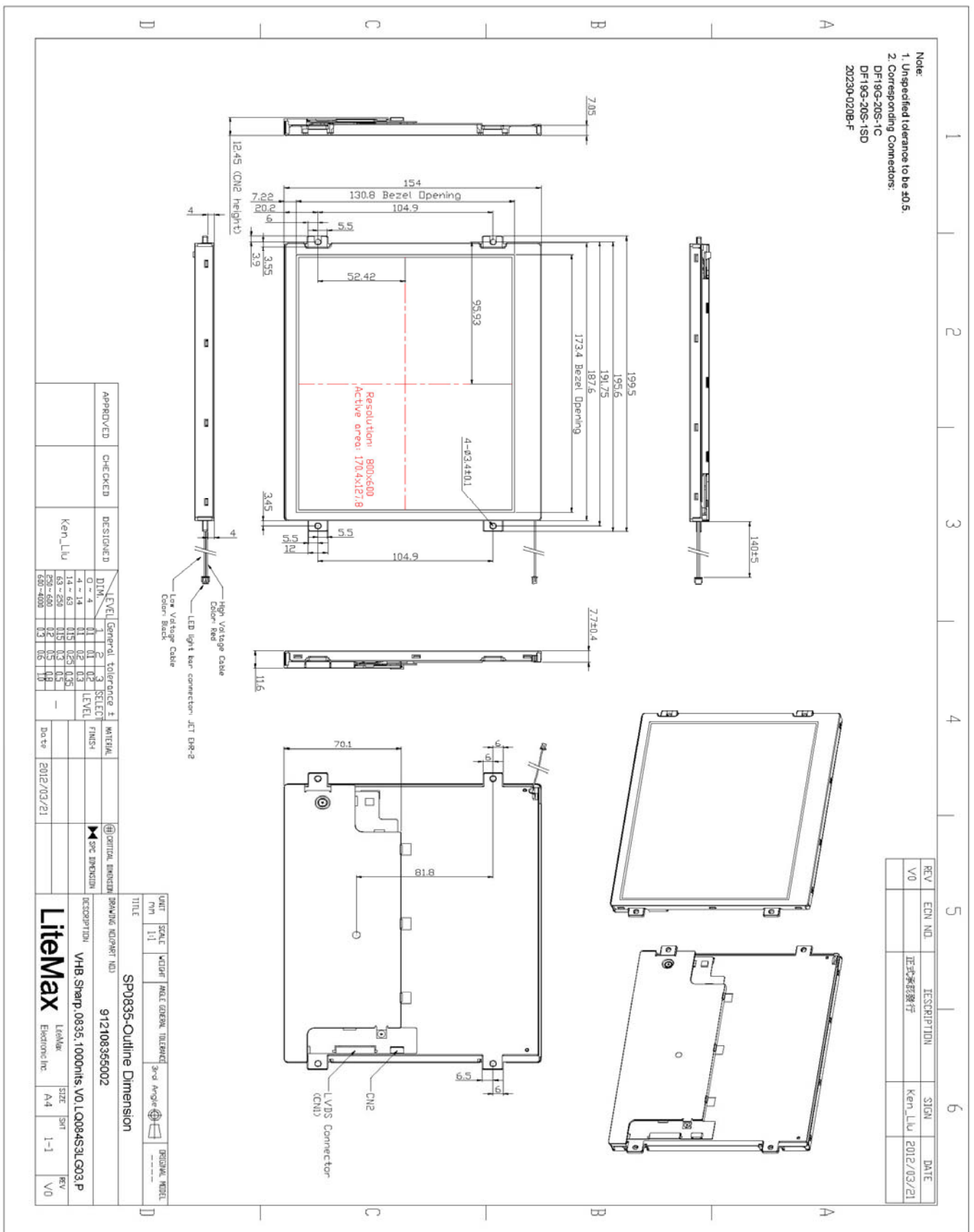
OSD Lock Function: It is possible to lock all the OSD buttons to prevent unauthorized changes to occur by pressing “Menu” and “right >” buttons simultaneously. You will see the “lock” icon below on the center of the screen for 3 seconds. If any button is pushed after the lock function is initiated, the below icon will appear on the screen.'



To release the OSD lock, press “Menu” and “Right >”. The below icon will appear on the center of the screen for 3 seconds. Now all OSD keys are active again.



9.0 MECHANICAL DRAWING



10.0 PRECAUTIONS

HANDLING PRECAUTIONS

- (1) The module should be assembled into the system firmly by using every mounting hole. Be careful not to twist or bend the module.
- (2) While assembling or installing modules, it can only be in the clean area. The dust and oil may cause electrical short or damage the polarizer.
- (3) Use fingerstalls or soft gloves in order to keep display clean during the incoming inspection and assembly process.
- (4) Do not press or scratch the surface harder than a HB pencil lead on the panel because the polarizer is very soft and easily scratched.
- (5) If the surface of the polarizer is dirty, please clean it by some absorbent cotton or soft cloth. Do not use Ketone type materials (ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanently damage the polarizer due to chemical reaction.
- (6) Wipe off water droplets or oil immediately. Staining and discoloration may occur if they left on panel for a long time.
- (7) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contacting with hands, legs or clothes, it must be washed away thoroughly with soap.
- (8) Protect the module from static electricity, it may cause damage to the C-MOS Gate Array IC.
- (9) Do not disassemble the module.
- (10) Do not pull or fold the lamp wire.
- (11) Pins of I/F connector should not be touched directly with bare hands.

STORAGE PRECAUTIONS

- (1) High temperature or humidity may reduce the performance of module. Please store LCD module within the specified storage conditions.
- (2) It is dangerous that moisture come into or contacted the LCD module, because the moisture may damage LCD module when it is operating.
- (3) It may reduce the display quality if the ambient temperature is lower than 10 °C. For example, the response time will become slowly, and the starting voltage of lamp will be higher than the room temperature.

OPERATION PRECAUTIONS

- (1) Do not pull the I/F connector in or out while the module is operating.
- (2) Always follow the correct power on/off sequence when LCD module is connecting and operating. This can prevent the CMOS LSI chips from damage during latch-up.